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EXAMINER

GUERRERO, MARIA F

ART UNIT PAPER NUMBER

2822

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,517

Applicant(s)

JAUSSAUD ET AL.

Examiner

Maria Guerrero

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11 and 16-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11 and 16-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This Office Action is in response to the Amendment filed December 21, 2004.

Status of Claims

2. Claims 1-10 and 12-15 are canceled. Claims 11 and 16-22 are pending.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on March 5, 2002 has been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 11, 16, and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Linn et al. (U.S. 5,387,555).
6. Linn et al. teaches a method of creating an electrically conducting bonding between a face of a first semiconductor element and face of a second semiconductor element by heat treatment (col. 4, lines 1-15). Linn et al. discloses depositing at least

one layer of material on the face of the first semiconductor element and at least one layer of material on the face of the second semiconductor element (Fig. 3a, 5a, col. 3, lines 49-56). Linn et al. teaches combining the layers to form a layer that provides electrically conducting bonding between the two faces (Fig. 3b, Fig. 5b, col. 3, lines 56-65, col. 4, lines 5-15). Linn et al. shows applying the first and second faces one against the other and carrying out a heat treatment (Fig. 3b, 5b, col. 3, lines 55-65). Linn et al. teaches reacting the layers of material to form a temperature stable mixture with respect to the first and second semiconductor elements (col. 3, lines 55-68, col. 5, lines 35-67, col. 6, lines 1-6). Linn et al. discloses not inducing any reaction product between the deposited layer of material and at least one of the semiconductor elements during the heat treatment (Fig. 4a-4b, col. 5, lines 35-67). Linn et al. teaches forming at least one oxide layer onto at least one of the deposited conductive layers and the oxide reacts such that the oxide formed is in a form of isolated precipitates that do not substantially harm the electrically conducting bonding (Fig. 5a-5b, col. 6, lines 58-67, col. 7, lines 1-28).

7. Regarding amended claim 11, Linn et al. inherently discloses a thin film included in a second semiconductor element because Linn et al. describes including the layer than is thin (500 angstroms) compare with the thickness of the second semiconductor element (600 microns) (col. 5, lines 30-60, col. 6, lines 40-60). Therefore, the claim is anticipated.

8. In addition, there is no requirement that a person of ordinary skill in the art would have recognized the inherent disclosure at the time of invention, but only that the

subject matter is in fact inherent in the prior art reference. Schering Corp. v. Geneva Pharm. Inc., 339 F.3d 1373, 1377, 67 USPQ2d 1664, 1668 (Fed. Cir. 2003). Toro Co. v. Deere & Co., 355 F.3d 1313, 1320, 69 USPQ2d 1584, 1590 (Fed. Cir. 2004).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linn et al. (U.S. 5,387,555) in view of Goesele et al. (U.S. 5,877,070).

Linn et al. also teaches the interposed layers comprising a layer of tungsten and a layer of silicon that could be on one of or both faces (col. 8, lines 20-25). Linn et al. teaches forming WSi₂ during the heat treatment (Fig. 5b, col. 7, lines 3-15).

Regarding claim 17, Linn et al. does not specifically show the first and second semiconductor elements being SiC. However, Goesele et al. shows the use of SiC in the bonding process as conventional in the art (col. 3, lines 50-60, col. 6, lines 15-16).

Regarding claims 18-20, Linn et al. does not specifically show the preliminary step of forming a thin film by forming microcavities on a substrate by ionic implantation. However, Goesele et al. teaches forming the thin film on the substrate by forming microcavities using ionic implantation (col. 6, lines 15-20, col.10, lines 13-30).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Linn et al. reference by including the steps of forming the thin film on the substrate by forming microcavities using ionic implantation and using SIC as taught Goesele et al. in order to increase device performance and thermal stability.

Response to Arguments

10. Applicant's arguments filed September 3, 2004 have been fully considered but they are not persuasive. Claims 21-22 stand rejected.

Applicant's arguments with respect to claims 11 and 16-20 have been considered but are moot in view of the new ground(s) of rejection. The amendment of claim 11 necessitated the new ground(s) of rejection because the scope of the claim does not correspond to any of the previously rejected claims.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., when no insulating layers are provided between the deposited layers and the semiconductor elements) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant argued that Linn et al. does not disclose directly depositing on the face of the first and second semiconductor because there is an electrically insulating material interposed between the semiconductor elements. However, Linn et al. discloses

depositing at least one layer of material on the face of the first semiconductor element and at least one layer of material on the face of the second semiconductor element (Fig. 3a, 5a, col. 3, lines 49-56). Linn et al. teaches combining the layers to form a layer that provides electrically conducting bonding between the two faces (Fig. 3b, Fig. 5b, col. 3, lines 56-65, col. 4, lines 5-15). Linn anticipates the claims because the claims recite depositing at least one layer and the semiconductor element has been interpreted as a broadest reasonable interpretation. Linn et al. teaches combining the layers to form a layer that provides electrically conducting bonding between the semiconductors faces (Fig. 3a-3b, 4a-44b).

Applicant argued that the thickness of the oxide layer disclosed by Linn et al. cannot be considered thin enough for forming the isolated precipitates as recited in claim 21. Applicant argued that the excess thickness is not recited on Linn et al. reference. However, there is not specific thickness required for the oxide film on the claim and there is not evidence of criticality in the passage cited by applicant because there is not any specific thickness recited. In addition, there is not any specific excess thickness required.

In addition, the elements must be arranged as required by the claim, but this is not an *ipsisimis verbis* test, i.e., identity of terminology is not required. In *re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

Furthermore, during patent examination, the pending claims must be "given *their* broadest reasonable interpretation consistent with the specification." > In *re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). While the claims

of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims must be interpreted as broadly as their terms reasonably allow. > *In re American Academy of Science Tech Center*, F.3d , 2004 WL 1067528 (Fed. Cir. May 13, 2004)(The USPTO uses a different standard for construing claims than that used by district courts; during examination the USPTO must give claims their broadest reasonable interpretation.) < This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) >; *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. *Cantarini et al.* (U.S. 5,973,257) (of record) is cited as evidence to show that the bonding layer formed by Linn is recognize in the art as an electrical conducting bonding layer (*Cantarini et al.*, col. 4, lines 34-37).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 571-272-1837.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 571-272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2822

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

March 16, 2005


MARIA F. GUERRERO
PRIMARY EXAMINER